

Abstract Submitted
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Lithium Loaded Target Plate for driving NSTX toward high performance¹ LEONID E. ZAKHAROV, RICHARD MAJESKI, Princeton University, PPPL — Following CDX-U, the NSTX device in PPPL is on its way to the new plasma confinement and stability regimes when the pumping lithium surface will provide a high temperature plasma edge. Both ion and electron gradient turbulence is expected to be suppressed in this regime, while the finite edge current density at the separatrix will stabilize ELMs. So far, NSTX has made only a modest step in this direction using the LITER evaporators, which did improve the boundary conditions for the plasma but did not provide pumping of the plasma particles. Nevertheless, even with such modest implementation of the idea of the LiWalls a significant improvement of the confinement as well as ELM stabilization became evident on NSTX. The real step toward the high performance requires transition to a target divertor surface with molten lithium. The only option for NSTX, which was not designed for lithium pumping, is the Lithium Loaded Target Plate (LLTP), with inertial cooling by a copper substrate (separated from lithium by a thin stainless steel or other material foil). The talk describes the reference LiWall regime in NSTX with a 6 fold increase of the confinement time compared to its current value. It also describes the consistency of LLTP with heat and particle extraction from the plasma.

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